THE EFFECTS OF FASTING

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FOREWORD

In the realm of sickness many a person has diligently searched for a panacea of all ills, a universal magic wand the waving of which would cause to vanish each and every conscious symptom of bodily and mental distress. This quest has been in vain. The object of the hunt has usually been some elixir or external entity which could in some manner be applied to the body and produce the miracle of renewed health. Little thought, however, has been devoted to an understanding of the Laws of Nature the operation of which we cannot escape, and failure was therefore unavoidable. Nor was any attempt made to evaluate and enumerate the true Causes of Ill-Health. Unless these are known and remove real health cannot be restored and maintained.

No universal remedy for disease has ever existed in the past, nor will any exist in the future. There is, nevertheless, a universal formula for the sane and proper care of the sick and this can be expressed as follows:—

"1. *Remove* from the life of the patient all materials, influences, habits and indulgences which are the *Causes of Ill-Health.*

2. *Provide* the fundamental *Essentials of Health.* These include adequate sleep and rest, proper nutrition, fresh air, sunshine, exercise, emotional poise and a positive mental attitude. They

should be provided in amounts which *can be used* by the body, bearing in mind the exact nature of the impairment of its function."

Nature is a delicately balanced system of Causes and Effects, the latter invitably following the operation of the former. When the body is not abused and its needs are provided, the effect is Vigorous Health. When the body is misused or its requirements are not adequately met, the effect is internal disease, which sooner or later manifest as conscious and observable symptoms of sickness. It is fortunate indeed that owing to the body's instinct of self preservation, there is always a movement towards health despite all and any influences to the country. Self-healing is a constantly operating property of the human frame, the success of which is limited only by the extent to which man obstructs the process and fail to supply its essential needs. Co-operate with the body, abide by the Laws of Nature which govern it, and well-being will be maintained in the healthy or restored to the sick, unless in the latter case, disease-producing influence have been operating for so long that irreversible structural changes have taken place. Incidentally, this point of no return is not reached so easily or in as many cases as orthodox authorities would have us believe for thier observations are based on patients "cared for" by methods which prevent the natural healing forces from operating to the fullest extent of which they are capable.

In the sick person two factors are usually

percent irrespective of the nature of the condition and these are :— 1. lowered vitality (enervation), and 2 the presence within the blood or tissues of toxic substance in excess of the amount which is normal to full health. Enervation occurs as a result of faulty nutrition or the abuse of the body in various ways, such as the use of stimulants, overworking, over indulgence in sensual pleasures (particularly those associated with sex and eating), insufficient rest and sleep, and negative mental and emotional attitudes such as fear, worry, greed, hate, etc. When vitality has been reduced in this way, the various organs of the body receive less than the required amount of energy and they therefore perform their various functions less efficiently and less completely than is desirable. Among them, the organs of elimination (kidneys, lungs, liver, skin) inadequately do their important job of detoxifying and removing the poisonous waste materials resulting from the life processes of the cells of the body and any other harmful substances which have previously gained entrance. These toxins begin to accumulate within the organism thereby providing a very real source of damage and disease, and they continue to build up and cause trouble unless the vicious circle is broken. To halt this pernicious process common to most examples of disease, the causes of the enervation must be discovered and discontinued. In addition, vitality must be conserved and recuperated in order that the vital function of inner-cleansing may once again be carried out successfully and completely.

For this reason Fasting (abstention from all food and drink except water), combined with total rest (where this is possible) is the most logical and most valuable approach to the problem of regaining full health. During Fasting energy consumption from daily activity is reduced to a minimum, energy for the digestive processes is not required and the body is permitted to concentrate all its forces on the task of elimina-tig toxins and repairing damaged tissues.

No remedy for all diease exists, but Fasting is very near to being a technique of universal application in the care of the sick. Yet this should not be so surprising, since the observation of undomesticated animals shows us that they widely refrain from feeding when feeling unwell. Why then should not Fasting be the programme of choice for that other animals, man, when he is in a less-than-healthy condition ?

The contents of this small book formed the substance of two articles which appeared in the Autumn, 1962 and Winter, 1962/3 Issues of "The Hygienic Practitioner" the quarterly professinoal Journal of the British Natural Hygiene Society, edited by Dr. George J. Hall N.D.D.O. D.N.H. I am very happy to agree to the publisher's suggestion that they be presented in this form for the benefit of patients and others who may be interested.

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THE EFFECTS OF FASTING

STAGES OF INANITION

1st Phase

This covers the period of transition from the physiological state of adequate (or semi-adeuqate feeding to that of fasting. The basal metabolic rate decreases until finally established at the true physiological minimum. This change usually takes from three to five days.

2nd Phase

Duration varies with the individual and with the circumstances of the fast. Usually ends 25-30 days after the commencement of the fast.

3rd Phase

Duration varies with the individual and with the circumstances of the fast. This period is characterised by a loss of strength.

During these stages physiogical activities are at the minimum peculiar to the individual. The length of these periods is mainly determined by the size of the person or the amount of food reserves stored in the sudject's body.

4th Phase

This commences when the food reserves have been exhausted and when in most cases natural hunger returns. The significant feature of this period is the predominance of pathological

phenomena During each phase the loss of weight is very approximately one-quarter of the total weight-loss sustained if, and by the time, death occurs. It can be seen from the above that there is an important distinction between fasting and starvation. On the one hand food reserves and other substances not vital to the functional integrity of the body are utilised for nutritive purposes. This is what occurs during fasting. Once these 'non-essential' materials have been exhausted, starvation commences and vital organic structure is broken down to provide nutriment for the now rapidly failing processes of life. At the same time, functional efficiency quickly decreases and pathological phenomena occur.

The effects of fasting have been classified for convenience under the headings "objective" and "subjective". Some of these, however, do not clearly fall exclusively into either category and the reader will be aware of considerable overlapping.

OBJECTIVE EFFECTS

1. FUNDAMENTAL FUNCTIONS

(a) Metabolism

During the first stage of a fast the level of metabolic activity is rapidly reduced until the physiological minimum for the individual is reached, usually after a period of 3-5 days,. After that, metabolism varies little from the new level until the end of the third inanition period or the return of true hunger. The metabolic rate established and approximately maintained in fasting is between three-fifths and three-quarters of normal level. When hunger returns, if feeding is not resumed, metabolism quickly decreases further to a pathologicial level.

The metabolic rate is ascertained by measuring the quantities of oxygen consumed and carbon-dioxide produced, both of which decrease during the early days of a fast. The metabolism of proteins, which is indicated by nitrogen excretion, follows the pattern of carbohydrate metabolism during fasting except in the case of babies. Owing to the limited reserves of glycogen it possesses, a baby utilises proteins for its maintenance at an earlier stage of fasting than do adults and the amount of nitrogen excreted increases.

When feeding recommences after a fast, the metabolic rate is observd to increase rapidly to a level, which is higher than that of the pre-fasting period. Physiological activity has become

more vital and less obstructed by toxic encumbrances, which have been eliminated to a greater or lesser extent, depending largely on the length of the fast.

(b) General Nutrition

An organism lives on the same thing when fasting as when eating, the essential difierence being that the nutritive reserves are replenished by eating, but expended by fasting. The vital organs and tissues must receive nourishment during a fast and this is provided by (1) food stockswithin the body, (2) less important structures, and (3) the salvable portions of dead and 'diseased' tissues. It is insisted by Hazzard and Carrington that during a fast toxins and accumulated waste are eliminated first. This means that excess food matter and 'diseased' tissues are initially the materials from which any available nutriment is taken and utilised by the body. Fat deposists, effusions, growths, infiltrations and oedematous swellingsare broken down into useful portions which nourish the living tissues and into alien parts which are eliminated. It cannot be stressed too strongly, that it is only after all surplus unwanted substances have been exhausted, i.e. utilised by or elimi uated from the body, that the vital living cells begin to be consumed. At this stage normal hunger returns and fasting gives way to starvation.

(c) Respiration

Respiratory function is greatly improved by fasting and this is demonstrated by the remarkable change for the better noted in cases of asthma. The lungs may very obviously become vicarious channels of elimination during fasting, as evidenced by the foulness fo the breath due in part to pulmonary excertion. During the early days of a fast respiratory (i. e. absorption of oxygen and elimination of carbon doxide) falls gradually to a new level owing to reduced metabolism. Towards the end of the second stage of inantion pulmonary activity is stepped-up once again, carbon dioxide production being less responsible than oxygen consumption, which is further increased to beyond the normal level in the third period.

(d) Elimination

The function of elimination is greatly enhanced during fasting and frequently unusual channels of excertion, as well as the normal routes, are used by the body to rid itself of accumulated toxins, waste matter, excess nutriment and 'diseased' tissues. No other procedure used in the care of the sick, facilitates as well as fasting does the necessary work of dislodging and discarding unwanted substances and structures. For a short period early in the fast elimination is greater than that prior to the fast, but later the amount thrown off is quickly reduced to a lower level. Before the fast the material eliminated

includes the residue of a food intake often in excess of that needed by the organism. Onee this superfluity has left the body, the rate of excretion represents more nearly the true wastes of the vital activities. A fruitful origin of toxic material is the alimentary canal (intestinal toxaemia) but this source ceases to exist during fasting. Only a short period of abstinence from all food is necessary to render the stomach and intestine sterile i. e. free from bacteria. This occurrence is observed also in hibernating animals.

(e) Defence against Poisons

Since the sensorial awareness of nervous system is much heightened during fasting, the body's efforts in its defence against poisons are more prompt and energetic while abstaining than the while feeding The administration of drugs to a fasting patient is always unwise, as it may lead to a fatal conclusion especially if the patient's condition constitutes an infection.

(f) Bowsl Action

With the majority of snbjects, the bowels cease to move i e ·/. evacuate during periods of inanition. A number of people experience bowel motions for the first few days only and a very few pass stools, regulry or occasionally for longer periods, or exhibit diarrhoea at times Those within this small minority frequently present some pathology of the lower alimentary canal. Evacuation of the bowels is often resumed sho-

rtly after breaking the fast, but there is no danger if restarting is delayed.

2. SECRETIONS AND EXCRETIONS

Generally the secretions are curtailed during fasting consistent with the actual requirements of the body and the excretions are increased in concentration if not in quantity also.

(a) Saliva

During fasting the secretion of saliva is diminished, even after water has been consumed in large quantities. The saliva in many cases has an unpleasant taste and has been known to cause vomiting It may become foul, thick, slimy, gelatinous and even like pus and its colour may become yellow, green or grey The saliva during fasting becomes neutral or slightly acid instead of its normal alkalinity. which is restored when feeding recommences.

(b) Gastric Juice

Though its quantity is reduced gastric juice continues to be secreted throughout the greater part of a fast The active principles (i e the enzymes) are missing from the fasting juice, but not the acidic content, and the reaction of the fluid is weakly acid Its secretion can be stimulated by such influences as the smell of food in many cases. With patients who have gastric hyperacidity, especially in the presence of grastritis or ulceration, discomfort or actual pain in the stomach usally continues and may even inc-

rease durfng the krst few days of a fast. It is not long, however, before the excessive production of juice ceases entirely, and provided the fast is maintained until complete repair of the gastric lining has occurred, distress will not accompany the resumed taking of food

(c) Pancreatic and Intestinal Juices

These juiees become weaker in their ability to digest during fasting. They are thought to be devoid of the usual enzymes and to be produced in smaller quantities.

(d) Milk

There is a quick diminution in the production of milk during fasting, which should therefore be employed in the case of a lactating mother, only when urgently necessary. Resuming eating does not often restore the normal rate of milk secretion after a three to four days' fast.

(e) Bile

No bile enters the intestine of a fasting animal and this is almost certainly true of a really fit human being who is abstaining. In the case of a sick man, bile continues to be produced and its quantity and character are apparently related to the degree of toxaemia existing at the commencement of the fast. This is because a function of the liver is detoxification, the products of which are eliminated in the bile and, during fasting, this process is much more active and greater amounts of bile are poured into the int-

estine. The fasting patients, who secrete the most bile and are the most uncomfortable, are those, who were previously consumers of large amounts of food particulary proteins and carbohydrates. The nature of this bile is such that its digestive value is much below norrmal. For one reason, the secretory function of the liver is believed to be at rest, as are the other glands which secretive juices. Its alkalinity is usually greatly reduced and on occasions it may even become weakly acid. The increased flow of bile may pass through the bowels or it may be regurgitated into the stomach and produce nausea and vomiting Bile which has been vomited during fasting is foul-smelling, is often mixed with mucus, and its colour varies from very dark to almost that of water. After vomiting, a patient is found to be much improved in his general condition. Shelton considers that "the sooner the 'over-production' of bile commences, after the cessation of eating, and the more bile is thrown off, the more rapidly the patient recovers his or her health.

(f) Mucus

Mucus voided during a fast is often copious, viscous, slimy and tenacious, Its colour may be transparent, while, yellow, grey or green. It may be discharged from the nose, coughed from the lungs and upper respiratory tract and expectorated, vomited from the stomach, passed from the bowels (sometimes as long tough rope-like lengths) or issued from the vagina. In each case

the amount expelled is often increased early in the fast, but is later reduced and finally ceases. Herein are provided examples of elimination vicariously used by the body.

(g) Sweat

Sweating, which is not normally a process of excretion, apparently becomes during fasting a method of vicarious elimination. 'Fasting' sweat is foul and sometimes excessive.

(h) Urine

During the early part of a fast, the urine smells strong and foul ond its colour is dark. It is very acid in reaction and has a high specific gravity, due to the enhanced quantities of phosphates, urea and bile pigment it contains. These characteristics represent an increase in elimination Examination of urine showing that its toxicity is higher than normal early in a fast. As the fast progresses, the colour of the urine becomes lighter, its unpleasant odour disappears and the mineral content and specific gravity are both lowerd. The reaction of the urine may become neutral or even alkaline.

The quantity of urine passed by a faster is governed, as at other times, by the water consumption and the degree of perspiration occurring. If no water is taken during a fast, the amount of urine eliminated is very small. If less than about $1\frac{3}{4}$ pints is consumed daily, the urine output

exceeds the intake, but if a greater quantity is imbibed, output approximately balances input.

(3) ORGANIC AND CHEMICAL CHANGES

(a) Brain and NerVous System

There is little change during a fast in either the size or structure of the brain, the spinal cord and the nerves. Towards the end of a long fast there is a certain loss, probably of fat, from the nerves and spinal cord, but the brain remains intact. All three types of structure continue adequately to govern the functions of the body.

(b) Heart

The work of the heart, calculated on pulse-rate, is cut by about twenty-five percent during fasting and there is a further saving, in that the force of its contraction is diminished. This organ receives much benefit and its tissues are greatly regenerated, both in functional and organic heart disease, as a result of fasting due, it is thought, to

(1) its improved nutrition frompurer blood,

(2) the reduction of its work-load, and

(3) the cessation of toxic stimulation once the poisons have been eliminated from the body.

(c) Kidneys

Kidrey function is improved during fasting owing to the removal of superfluous and toxic material, e. g. fat, from the kidneys, and to better nutrition. The loss of kidney substance

is insignificant and is usually proprtionately smaller than the total body decrement. Kidney tissue is not repaired to and great extent by fasting.

(d) Liver

The glycogen content of the liver is almost entirely consumed during the first two days of a fast. This organ loses proportionally much more than the other organs except the spleen, the substances absorbed being, apart from glycogen, water and fat.

(e) Lungs

Congestion of the lungs is quickly relieved when food is discontinued and this permits of a higher degree of aeration and more efficient elimination via this chaenel. regenerative power of the lungs is very great and much benefit is derived by them from fasting. Healing of lung tissue takes place more rapidly and more successfully than that of any other organ.

(f) Muscles

Voluntary muscles are affected sooner and more extensively than the involuntary ones by a period of fasting. By the time death from starvation occurs, the former type of muscle is reduced in weight by 30 40% and that of the heart by only 3%. It seems that the number of muscle fibres is not reduced by a fast, but the individual cells become smaller. Initially the glycogen and fat content of the cells is absorbed and

utilised. Later there is a loss of cytoplasm from the muscle cells and a corresponding diminution in strength or muscle power.

(g) Skin

The skin is rejuvenated by fasting. This is due to the loss of its fat deposits, and to the improvement in its circulation as demonstrated by its full and rapid response to pinching. Wrinkles, pimples and other blemishes tend to disappear during fasting and the texture and colour are greatly improved.

(h) Bones

The bones themselves apparently do not suffer any loss during fasting, and may even continue to grow, where as the marrow, which normally contains food reserves, is greatly utilised as nutriment.

(i) Teeth

Like other bones the teeth evidently do not suffer a loss of substance during a fast. Loose teeth have been known to become firm, teeth marked with decay to become white and clear, toothache to vanish and discased gums to heal, all within periods of fasting. Fillings occasio nally fall out' but it is not certain whether this is due to the withdrawal of minerals from the cavity or whether it represents an attempt on the part of nature to remove an alien body prior to healing the tooth.

(J) Stomach

Far from weakening the stomach, as is often suggested, fasting permits it to relax and recuperate its various parts. Its muscles are rested,

motility is improved and distension and prolapse are overcome as the stomach gradually resumes its normal position. Its glands are rejuvenated and digestion is later more efficient. Inflammation of its lining mucosa passes away, ulcers heal and any catarrhal condition is dispersed. Finally the appetite becomes normal.

(k) Pancreas

This organ becomes smaller and firmer during fasting, but rapidly returns to its normal size and consistency following eating. General pancreatic tissue is rapidly regenerated during abstinence.

(l) Spleen

Fasting quickly reduces the size of the spleen, the loss being almost entirely water. The normal size resumed after feeding recommences.

(m) Blood

The quality of the blood is improved by fasting, for not only is this important fluid medium purified of its toxin content, but also, the blood-forming tissues following regeneration tend to produce cells normalised both in regard to number and structure. Fasting does not produce any morphological changes in normal blood cells, but may result in abnormal cells being replaced by typical ones.

The red cells generally increase in number, but in some cases this occurs after an initial and brief drop Even tually the red cell count will decrease, although this does not occur until starvation begins. With most fasters the white cell count falls.

Abstention from food result in the reaction of the blood becoming less alkaline, normality being resumed after the fast is broken. Fasting according to some of its critics, is said to cause acidosis, but this is not so, otherwis it would become increasingly evident as the fast progressed. However, symptoms of acidosis, such as lassitude, irritability, headache and backache, often occur in the early part of a fast and represent a healing crisis, which disturbs the patient for no more than a few days. Benefit from the crisis is roughly proportional to the intensity of these symptoms.

(n) Chemical Changes

During fasting different substances are lost from the body at different rates, the more valuable ones disappearing less rapidly, in addition to which, there is a re-allocation of elements and compounds within the body. Organic material is lost more rapidly than the relatively more important mineral elements. Also these latter are shuffled around to some extent, as for instance the increase of calcium and decrease of phosporus and sulphur in muscles. The spleen, liver and brain receive extra quantities of inorganic elements at the expense of the muscles and blood Iron, freed by the autolysis of cells and tissues during fasting, remains in the liver, spleen and elsewhere.

4. STRENGTH

During the first two periods of fasting. roughly speaking, there is a gain in strength in

most, if not all, cases. Strength is the net result of three factors:—

(1) muscle integrity,

(2) The quality of the blood in relation to the supply of nutrients to, and the removal of waste from, the muscles, and their freedom from toxic irritation, and.

(3) The availability of vital nerve force for muscular activity. Alien encumbrances are removed from the muscles during fasting. At the same time the blood is purified and vital energy is recuperated. It is easy to see therefore, that fasting brings about an increase in strength and that this is more evident in those originally more distressed by toxic overload, i. e. those whose weakness and prostration were the greater before fasting

The foregoing statements are concerned with actual strength and not with the feeling of strength. Some fasters especially those whose habits of living leave much to be desired and whose intake of stimulants has been regular and varied, experience weakness and prostration. As previously explained the body exhibits compensation in disease processes i. e it diverts vital power from the less essential functions to the more urgent ones of protection, elimination and healing. It is this withdrawal of energy from the muscles, which produces the feeling of weakness in some cases. A mental factor may also be involved. Nervous sensitive people tend to suffer a feeling of weakness, but this is due partly to auto-suggestion. Furthermore, the

cessation of stimulant-taking produces depression and languor on most fasters.

When a fast is broken, any feeling of weakness which hitherto existed, gives way to one of strength and vigour. The change-over is almost instantaneous and is therefore due to mental attitudes rather to food itself.

The increase of actual strength during fasting has been demonstrated irrefutably on many occasions. Tests carried out during the experimental fats of Succi and Levanzin, showed that there was a definite increase in strength up to the twenty-first day in the case of the former and up to the thirty-first day with latter. Person unable to walk, climb stairs or perform similar other activities have during a fast not only regained their ability but also increased their capaciry for doing these things. On one occasion eight athletes fasted for seven days under the direction of Bernarr Macfadden and during that time carried out progressively more difficult tasks of endurance and strer gtb. One of their number, Gilman Low, did not eat until the end of the eight day and then proceeded pubicly to break nine world records for strength and endurance, which remained unbeaten for years including, for example, raisir g 1500 pounds 35 times in 25 seconds using only the legs and raising 2200 pounds 29 times in 20 seconds.

When a fast continues past the point when the fat and glycogen of the muscles have been completely absorbed, the body begins to utilise the cytoplasm of the mucle cells and the third

phaseof inanition is entired.As the muscles waste below a particular minimum, the actual strength of the faster decreases, althongh there is no falling-off of the vitality The loss of strength occurs more rapidly in those originally possessing much fatty and water-logged tissue. When proper feeding is resumed, the muscles are quickly rebuilt and actual strength increases, as shown by an example within the writer's experience. The person in question, underweight and suffering from a serious liver condition, was fasted for forty-seven days. The third stgge of inanition had been entered and the fast broken because of extreme weakness, yet only three weeks later, the patient cycled 30 miles all told to and from a consultion without undue fatigue. Continuing to follow a Hygienic way of life, he has maintained excellent healh.

5. BODY WEIGHT

Perhaps the most obvious effect of fasting is the loss of body weight and it is the one which seems to cause relatives and friends of patients the greatest concern.

In order for the body to maintain its temperature, perform its vital functions and produce mental and physical effort. stored food material must be converted into various forms of kinetic energy, and as this nutrient decrement is not replenished during fasting the weight of the body decreases. It is estimated that on an average about one pound per day is lost by the faster and this can be seen from Tables 1 & 2 below. The cases quoted are not intended to have a stat-

istical value, as they are too small in number, but are gived merely as examples.

TABLE I
LOSS OF WEIGHT DURING A FAST
(Form 'Vitality, Fasting and Nutrition' by Carrington)

Weight at Commencement (lbs.)	Weight at Conclusion (lbs)	Length of fast (Days)	Weight Loss (lbs.)	Weight Loss as % of Initial Weight
1. 228	174	50	54	23.7
2. 150	123	22	27	18.0
3. 178	165	10	13	7 0
4. 182	158	20	24	13.2
5. 165	154	23	11	6.7
6. 135	127	8	8	5.9
7. 108½	72½	41	36	33.2
8. 136	103	28	33	24.3
9. 117	92	34	25	21.4
10. 135	118	17	17	12.7
T. 1534 1/2	1286 1/2	253	248	

TABLE 2

LOSS OF WEIGHT DURING A FAST

(Selection from Author's Cases)

	Welght at Commen-cement (lbs.)	Weight at Coucluc-sion (lbr.)	Lcngth of fast (Days)	Weight Loss (lbs.)	Weight Loss as % of Initial Weight	Aetivity During Fast
1.	129	118	22	11	8.5	Completo bed rest
2.	119	101 1/2	11	17 1/2	14.7	Normal activity for first few days
3.	129	117	11	12	9.3	Mainly bed-rest with short period of normal activity.
4.	63 1/2	42	37	21 1/2	33.9	Complete bed rest, reading etc. (Girl of 12 yrs)
T.	440 1/2	378 1/2	18	62		

The actual loss sustained and the rate of loss in a particular case will depend on several factors. A plump subject with water-logged tissues will lose weight much more rapidly than a thin one and his total loss after a given period, proportional to his pre-fasting weight, will be greater. Weight loss is also related to the activity of the faster, being roughly proportional to the degree of animation (see Table above).

Generally speaking, as the fast progresses, so the rate of loss of weight decreases. In the early stages as much as two or even three pounds may be lost per day especially in very obese subjects, but towards the end of a prolonged fast less than eight ounces may be shed Occasionally a faster will temporarily increase in weight and this has been attributed to (a) absorption of moisture, carbon - dioxide or oxygen or more probably (b) incomplete oxidation of fat resulting in the formation of glycogen (each gram of fat incompletely oxidised would add 0.76 grams to the body weight

It has been estimated that a person may lose 40% of his initial weight without life being endangered, provided that the original weight is approximately normal. However, even a prolonged fast rarely lightens a subject to that extent. Succi, who fasted forty days only lost 25 3% body weight and Levanzin (31 days) only 24 0% (See also cases 1,7,& 9 in Table 1 and case 4 in Table 2).

Heat which is lost from the fasting body to the atomsphere and to surrounding objects making contact with it, has to be replaced, with the

expenditure of energy and a concequent lowering of food reserves. Body weight loss is, therefore, related to heat loss. Now heat loss per unit body weight is a function of the surface-area/body-weight ratio. Hence smaller people (with their higher surface-area/body-weight ratios) lose weight while fasting at a greater rate than larger folk, all other things being equal. (See case 4 in Table 2 above-12 year-old girl-whose weight loss was 34.6% after only 37 days fasting. Compare this with case 7 in Table 1, who was nearly twice as heavy originally and lost only 33.2% after 41 days and with case 1 in Table 1, who was three and a half times heavier originally and lost only 23.7% after 50 days. These comparisons provide only indications, as these cases were dissimilar in several respects).

The materials converted into energy during inanition, are derived mainly from the tissues of the less important organs, even when food is withheld for prolonged periods. The vital organs remain virtually untouched even in cases where the fasting period is exceeded so that starvation proceeds and death ensues. Below in Tables 3&4 is shown how the various organs contribute to the weight loss of the body in fatal cases of starvation and these figures are taken from "Death from Starvation" by Voit.

It will be noticed how even in death, the brain and nervous system and the heart each lose only 3% of their individual weights and contribute only 0.1% each to the total body weight loss. Conversely the fat deposits are virtually exhausted and the muscles and non-vita

parts of other organs are extensively consnmed in the provison of energy for life itself to cotinue to the uttermost limit.

TABLE 3

Percentage of Total Body Weight Loss borne by Each Organ in Death from Starvation.

Muscle	42.1%
Fat	26 2%
Skin	8.7%
Bones	5.5%
Liver	4.8%
Blood	3.6%
Intestines	2.0%
Kidneys	0.6%
Spleen	0.5%
Lungs	0 3%
Pancreas	0.1%
Testes	0.1%
Brain & Nerves	0.1%
Heart	0.1%
Water loss & food loss from Alimentary canal	5.3%
	100.0%

TABLE 4

Percentage Weight Loss of Each Organ in Death from Starvation.

Fat	97%
Spleen	67%
Liver	54%
Testes	40%
Muscle	3[illegible]%
Blood	27%
Kidneys	26%
Skin	21%
Lungs	18%
Intestines	18%
Pancreas	17%
Bones	14%
Brain & Nerves	3%
Heart	3%

6. GROWTH

Growth is an internal force, which is inherited and which may be looked upon as synonymous with life. It is regulated by water, food, air, sunlight, warmth and the intricate mechanism of the endocrine glands. Nutriment is the meterial of development but not its motivating force. During periods of inanition or insufficie-

ncy of food, growth is not in abeyance, but continues in a limited manner, which is consistent with the total and various needs of the organism. In the same way as the fuel for vital functions and urgent disease processes is withdrawn form the less essential structures during fasting, so also is the pabulum gathered for the now restricted operation of the growth process. Increase in stature may occur concurrently with obvious wasting of tissues such as subcutaneous fat.

On the resumption of feeding, which is adequate quality-wise, the process of growth is rapidly speeded up and requires less food than prior to the fast to achieve the same degree of development, all other things being equal.

SUBJECTIVE EFFECTS

1. Mind

One of the most prevalent effects of fasting occurs in relation to the mind and its various faculities, all of which are thereby improved. This benefit is experienced by nearly all fasters, in many instances not until a few days after the commencement of inanition but continuosly from then onwards. The delay occurs also with subjects accustomed to a variety of modern stimulents, such as alcohol, caffeine, nicotine etc., the withholding of which frequently produces physical and mental depression As elimination proceeds and vitality increases, both fields of activity are pursued the better. In the mental sphere, concentration is found to be easier and recollection the more complete and far-reaching. Indeas flow more smoothly and thought becomes more logical. Apart from a sharpening of the intellect, there is also a change in the spiritual and emotional realms. Increased awa-

reness and intuitive ability, as well as a greater capacity for affection (in the broadest sence), fellowship, benevolence, compassion etc. have all been experienced and observed during and after fasting.

In order to attain mental and physical efficiency both Socrates and Plato are reputed to have undergone ten-day fasts, and Pythagoras went without food for forty days prior to his examination at the University of Alexandria. On a number of occaions several male and female students at Chicago University continued their usual routine of lectures, sport etc, while fasting for one week. The result each time was increased mental agility and ability and accelerated progress.

A word about fear may be conveniently inserted here. Dread of fasting is one of the very few contraindications to its use. Such apperehension may be present before or develop during inanition and in these cases the fast should not be started or should be broken respectively. Fear like all other negative attitudes and emotions, inhibits elimination and rapidly depletes the body's stored reserves. Also, evidence leads to the conclusion that death has resulted purely from fear in a few subjects.

The popular press, through ignorance, has regrettably done much to foster fear of fasting among the masses. The misuse of the word 'starvation' where only 'fasting' is correct, and the oft repeated advice that one must eat to keep up one's strength, are only two ways in which

the unjustifiable fear of fasting is widely engendered.

Fasting is in no way dangerous or to be feared, if it is understood and properly conducted.

2. Special Senses.

Except where certain pathology prevents it, fasting invariably brings about.

1) Remarkable improvemet in the faculty of sight, and clarity and brightness of the eyes,

2) Sharpening of the sense of touch,

3) Refinement of the capacity of tasting (obviously not noticed before breaking the fast),

4) Improvement of the sense of smell, and

5) Increased acuity of hearing.

The last two benifits often produce discomfort when the faster first leaves his quiet well-ventilated room, as previously unrecognised smells and formerly heard but-tolerated and unheard sounds now imipinge forcibly upon his consciousness.

3. Pain

Fasting frequently brings relief to a person in pain, even if the latter be considerable After a few days without food, the pain usually disappears or is greatly reduced in intensity, because of this, fasting may be considered desirable even in hopeless cases of cancer, in order to permit the unfortunate sufferer to spend his or her last days in relative peace, which is often impossible when pain killing drugs are administered.

4. Hunger and Appetite

What is commonly referred to as 'hunger' or 'appetite' is not true hunger i. e a call for food

which is definitely needed by the body, but something quite different. On many occasions it is a conditioned reflex, developed as a result of eating by the clock, rather than in response to the demands of mental and physical activity and environmental conditions. It represents a state of expectancy as meal-time approaches. False hunger may also be experienced where there is gastric irritation, neurosis or certain other examples of pathology.

In most cases a desire for food remains during the first day of a fast, is heightened on the second day, then decreases ond finally abates by the fourth day. In a few cases, especially where there is pathology of the alimentary canal, the appetite remains for a few days longer. From then on with nearly all fasters, there is no further desire for food until the end of the third period, when true hunger unmistakably returns and feeding must recommence. Sometimes there develops a repugnance to food, and nausea and vomiting may occur at the mere thought, smell or sight of an otherwise tempting dish. The opposite has also been observed by the author, in cases where the subject delights is seeing and smelling other people eat, yet is quite content not to do so himself.

Occasionally a fasting patient will experience a desire for food after the original appetite has ceased to occur. This may be due to toxic irritation or be mental in origin and the practitioner has to assess the total condition of the patient, that he may decide whether the sensation be

true hunger or not. When it is not, it frequentl disappears after a while or precedes a crisi: Either way the fast should continue.

5. Sexual Desire and Fulfilment

During fasting both men and women usually experience disappearance or at least diminution of the desire for sexual communion. There are exceptions, however, to this tendency and cases have occurred, in which sexual desire was heig htened to such a distressing extent, that it becam necessary to discountinue fasting. The resum ption of feeding by these individuals reduce the desire. With the majority of fasters sexu appetite returns with hunger or the reingestio of food, although occasionally this may be del ayed for a while.

After a few days of abstantion from food sexual intercourse becomes impossible in mos cases and with both sexes, but again exceptiou have been known. This lack of ability repres nts a brief aboliton of sexual function, for fu vigour and potency returns when the sensatic of hunger re-appears or when eating is re-inst tuted after shorter fasts.

6. Sleep

The period of sleep with nearly all faster is no longer than four hours per day. A fastin person is a less active one, especially, of course. when deliberate resting accompanies the absten tion, and consequently less sleep is needed. The difficulty of keeping warm sometimes prevents sleep, as does also the inability of the subject to sufficiently relax. One faster went without sleep for twenty one days without any ill-effects.

THE EFFECTS OF FASTING

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